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Case report

Chylous ascites as a complication of nephroureterectomy

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ABSTRACT

Chylous ascites may be the result of many pathological conditions, including congenital defects of the lymphatic system, nonspecific bacterial, parasitic and tuberculous peritoneal infection, liver cirrhosis, malignant neoplasm, blunt abdominal trauma, and surgical injury. A 62-year-old woman presented with chylous ascites after undergoing nephroureterectomy and bladder cuff excision for her left ureteral urothelial carcinoma. The diagnosis of chylous ascites is made when the ratio of ascitese versus serum triglyceride is > 2. Patients with chylous ascites may be treated conservatively with total parenteral nutrition and/or a diet containing low fat and medium chain triglycerides. Refractory cases may require more aggressive intervention. We report a case of postoperative chylous ascites that was treated successfully with total parenteral nutrition for 14 days. A review of the relevant literature is presented and chylous ascites treatment is also discussed.

1. Introduction

Postoperative chylous ascites (CA) is a rare complication of retroperitoneal surgery. The diagnosis of CA is made when the ratio of ascites versus serum triglyceride (TG) is > 2. There are several treatment options for postoperative CA, ranging from conservative treatments to surgical intervention.[1] Refractory cases may require more aggressive intervention. We present the case of a 62-year-old woman who developed CA after a left open method nephroureterectomy and bladder cuff excision for an upper ureteral urothelial carcinoma (UCC) that was treated successfully with total parenteral nutrition (TPN) for 14 days. We present a review of the relevant literature and discuss CA treatment.

2. Case Report

This 62-year-old woman has suffered from hypertension for about 30 years and controls her condition through regular medication. She has a history of urolithiasis and had undergone lithotripsy several times. An upper ureteral UCC was diagnosed via an ureteroscopic biopsy. Abdominal computed tomography (CT) was arranged and showed abnormal thickening of the left upper ureter, extending to the pelvocalyceal system, compatible with UCC (Figure 1A). Multiple para-aortic lymphadenopathies at the level of the renal hilum were noted (Figure 1B). Left ureteral UCC, cT2N1M0, stage IV, was diagnosed at that time. In addition, the effective renal plasma flow (ERPF) was checked in April 2012, and showed no function in the left kidney (left kidney ERPF = 0 mL/min; right kidney ERPF = 206 mL/min). Laparoscopic left nephrectomy was tried in the beginning. We converted to the open method via a left subcostal incision owing to severe pedical adhesion. Renal pedicles were identified and ligated after carefully separating and dissecting the regional lymph node and adhesion. Meticulous ligation of ureteral adjacent vessels and lymph duct were performed. Bladder cuff excision was carried out via Gibson incision. The whole specimen retrieval was performed from a subcostal incision. The bleeder was checked carefully, and Jason–Pratt (J-P) drains were placed over the renal hilum and perivesicle site, respectively, prior to wound closure. The entire open method procedure was uneventful. Two days after the operation, after bowel movement, the patient started to consume water and then gradually shifted to a regular diet. The drainage fluid remained serosanguinous in color initially, which became progressively lighter day by day. However, a large amount of milky white drainage fluid was noted within the J-P drain bulb incidentally 7 days after the operation. The patient presented with stable vital signs. There was no fever, chillness, nausea, or vomiting. A

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Fig. 1. (A) Transverse view: abdominal computed tomography (CT) shows severe hydronephrosis and abnormal thickening of the left upper ureter due to urothelial carcinoma (arrowhead) obstruction and extending to the pelvocalyceal system. (B) Coronal view: abdominal CT shows para-aortic lymphadenopathies (arrowhead) at the level of renal hilum.

physical examination revealed a soft abdomen without tenderness and rebounding pain, but with hyperactive bowel sound. The incision wounds were clear. The drainage fluid from the J-P drain bulb was sent for laboratory examination, and yielded the following results: TG, 1299 mg/dL; lactic dehydrogenase, 257 IU/L; glucose, 80 mg/dL; total protein, 3.1 g/dL; and creatinine, 2.5 mg/dL. Results of the blood biochemical examination were as follows: serum TG, 135 mg/dL; lactic dehydrogenase, 187 IU/L; total protein, 6.4 g/dL; and creatinine, 2.25 mg/dL. An abdominal CT scan was done and it revealed small amounts of enhancing soft tissue in the left adrenal space, and no hollow organ injury was identified (Figures 2A and 2B). The drainage culture showed no isolated anaerobic pathogens days later. Thus, CA was diagnosed according to the definition. Chest surgery and nutrition department experts were consulted. Nil per os (NPO) with TPN were suggested accordingly.

During the whole 14-day course of NPO and TPN treatment, the patient denied any abdominal discomfort. The milky white drainage fluid turned into serosanguinous fluid, and the drainage amount decreased steadily after TPN treatment. We removed the J-P drain 16 days after the operation. She resumed oral intake of a low fat soft diet and was discharged under a stable condition.

3. Discussion

CA is a rare form of ascites characterized by a milky-appearing fluid containing high levels of TGs.[2] It may be the result of many pathological conditions, including congenital defects of the lymphatic system, nonspecific bacterial, parasitic and tuberculous peritoneal infections, liver cirrhosis, malignant neoplasms, blunt abdominal trauma, and surgical injuries. The most common etiological factors are abdominal malignancies and congenital lymphatic abnormalities in adults and children, respectively.[3] The ascending vertical lumbar lymphatic trunks, which are the major lymphatic channels in the retroperitoneum, are formed by the coalescence of the common iliac lymph vessels, which derive from the lymphatic glands of the lower extremities, genitalia, and pelvic organs. The retroperitoneal lymphatic glands are the regional lymph node drainage mechanism for the kidneys and testicles, and the secondary drainage site for the external genitalia, perineum, and pelvic organs. Retroperitoneal urological surgery, mainly lymphadenectomy performed for testis and renal cancer, involves extensive dissection that may lead to disruption of the major retroperitoneal lymphatic channels and result in chylous

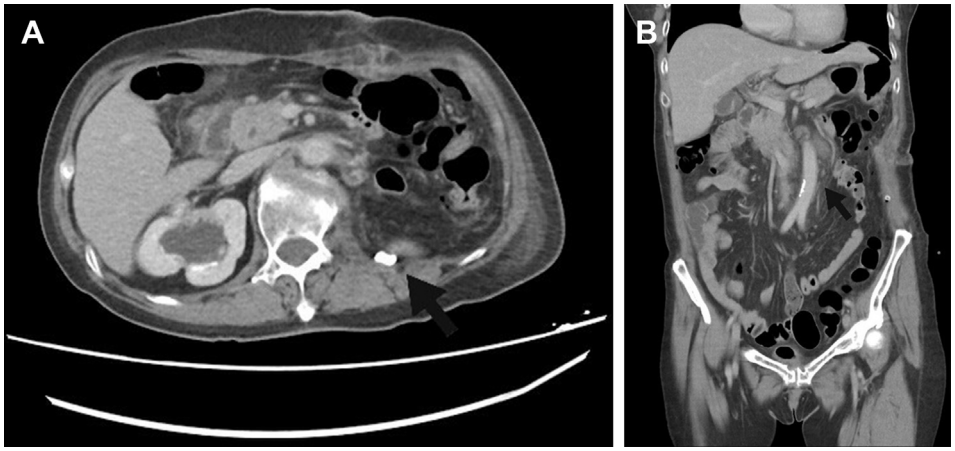

Fig. 2. (A) Transverse view: abdominal computed tomography (CT) shows postoperative retroperitoneal drainage tube placement with minimal ascites. (B) Coronal view: abdominal CT shows small size para-aortic lymph node and no definite hollow organ injury is noted.

collections.[3] Postoperative CA pathogenesis comprises interruption of the cisterna chyli or other major retroperitoneal lymphatic channels, resulting in lymphoperitoneal fistula formation and chylous fluid accumulation in the abdominal cavity.[4]

The time frame of postoperative ascites development varies from several days to several months after the surgery.[3] It usually becomes apparent after 5–12 days with increased oral intake after the surgery.[5] The appearance of the fluid is usually described as milky or chylous. The most common clinical presentation of CA generally is increasing painless abdominal distension.[2] It may lead to a shortage of electrolytes, fats, proteins, fat soluble vitamins, lymphocytes, dehydration, or even death due to sepsis.[6] Rare cases may present with nonspecific symptoms with only milky ascites in drainage fluid as in the case with our patient.

In a cohort of 1103 patients undergoing abdominal surgery, the incidence of postoperative CA was reported to be 1.1%.[2] The incidence was higher in those who had undergone lymphadenectomy (13.9% vs. 4.0%, $p = 0.027$) in patients with radical nephrectomy and nephroureterectomy.[3] CA developed more often after left nephrectomy than right nephrectomy (7.3% vs. 2.5%, $p = 0.010$).[4] The cisterna chyli, which is saccular dilatation of the ascending vertical lumbar lymphatic glands, is located around the aorta, and in front of the first and second lumbar vertebrae. It may be interrupted when extensive retroperitoneal dissection and/or lymphadenectomy is done during left nephrectomy. In the laparoscopic era, the incidence of postoperative CA incidence is increasing.[4] Monopolar, bipolar, or ultrasound coagulation is used during laparoscopic surgery; such procedures may also lead to lymphatic channel disruption. However, we converted to the open method nephrouretectomy with meticulous technique to achieve hemostasis and lymphostasis owing to failed laparoscopy. To identify renal artery and vein securely, we extensively dissected the hilar region and severe adhesion over the renal pedicle with ultrasound coagulation during laparoscopy. These procedures may cause lymph channel interruption and possibly contribute to postoperative CA.

The diagnosis of CA is confirmed by analyzing the ascites fluid obtained by paracentesis. A TG ratio of CA versus serum of > 2 is necessary for a diagnosis of CA.[5] The imaging of the lymphatic system plays an important role in the investigation of CA. Lymphangiography is useful for diagnosis and should be performed early in the course of evaluation when the diagnosis is not yet certain.[7] Recently, Pui and Yueh[8] reviewed previous experiences with (99m)technetium–antimony sulfide colloid, human albumin, or dextran lymphoscintigraphy for evaluating chylous complications. They emphasized the safety and simplicity of these studies compared with standard lymphangiography and concluded that lymphoscintigraphy can accurately reveal abnormal lymphatic drainage and is thus useful for patient selection for surgery and assessment of treatment outcome. Another isotopic test that may indirectly add to the diagnosis of chylous collections is a simple diaminetriamine-pentaacetic acid renal scan. The detection of (99m)technetium–diaminetriamine-pentaacetic acid in the peritoneal cavity after a renal scan is a suggestive sign of CA.[9] CT findings are not specific to CA. Although the diagnosis of cisterna chyli ruptures may be indicated on CT by the concomitant extraperitoneal and intraperitoneal collections, the CT density of CA usually resembles that of water with identical attenuation coefficients, and it is indistinguishable from bowel secretions, urine, bile, or simple ascites.[6]

The management of CA should be based on a gradually incremental approach, from conservative treatments to surgical intervention. It is primarily conservative, intended to decrease the flow of lymph in the mesenteric lymphatic glands that join together in the disrupted major retroperitoneal and thoracic ducts, and consequently limit the leakage of lymph into the peritoneum. Additional treatment goals are the alleviation of mechanical symptoms related to the distended abdomen and the replacement of significant nutritional losses. It is often performed with various combinations of dietary intervention and TPN.[3] Nutritional manipulations alone or combined with diuretics and paracentesis may be effective for mild to moderate cases of CA, resulting in a successful outcome in up to 50% of cases.[3] Continuing the medium chain TG diet is suggested as maintenance therapy for several months after the successful resolution of the chyloperitoneum. In the literature, somatostatin or its analog (octreotide) also proved highly effective in patients with protracted symptoms of CA. Fortunately, our reported case was treated with TPN and then medium chain TG diet successfully without sequelae. Persistent active lymphatic leakage and continued formation of CA after several weeks of maximal conservative treatment warrant a more aggressive approach, including insertion of a peritoneovenous shunt or direct surgical lymphostasis by suture ligation of the disrupted lymphatic channel.[10]

Patients with CA may be treated conservatively with TPN and/or a diet containing low fat and medium chain TG. Refractory cases may require more aggressive intervention. The most important factor is to prevent CA. Thus, meticulous clipping or ligation of all perihilar and retroperitoneal fibrous fatty tissue during dissection around major vessels is the method of choice. We report a case of postoperative CA that was treated successfully with TPN for 14 days. In this report, we reviewed the relevant literature and discussed CA treatment.

Conflicts of interest

The authors declare that they have no financial or non-financial conflicts of interest related to the subject matter or materials discussed in the manuscript.

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